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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/080,849	02/22/2002	Aaron J. Hanna	K35A1056	9641

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EXAMINER

MAGEE, CHRISTOPHER R

ART UNIT PAPER NUMBER

2627

DATE MAILED: 03/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/080,849	<b>Applicant(s)</b> HANNA ET AL.	
	<b>Examiner</b> Christopher R. Magee	<b>Art Unit</b> 2627	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 12 January 2006.
- 2a) ☐ This action is FINAL.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-54 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 15-54 is/are allowed.
- 6) ☒ Claim(s) 1-4, 6-8 and 11-14 is/are rejected.
- 7) ☒ Claim(s) 5, 9 and 10 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>1-12-2006</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments, see Remarks, pages 15-21, filed 1/12/2006, with respect to the rejection(s) of claim(s) 1-4, 6-8, and 11-14 under Hatch et al. (US 5,471,734) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Takagi et al. (US 6,721,133 B2). The new ground (s) of rejection follows:

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 6, and 11 are rejected under 35 U.S.C. 102(e) as being anticipated by Takagi et al. (hereinafter Takagi) (US 6,721,133 B2).

- Regarding claims 1, 6 and 11, Takagi discloses a disk drive [col. 3, lines 4-14] having a disk [19] with a recording surface (inherent property of a disk drive), comprising:  
a head stack assembly [Fig. 2], including:  
a body portion [41];  
an actuator arm [30] cantilevered from the body portion;

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a hinge portion [32], a first surface of the hinge being coupled to the actuator arm [Fig. 4];

a load beam [31] having a first end and a second end, the first end including a load beam surface that faces and contacts a second surface of the hinge [32], the second surface facing away from the first surface [Fig. 4];

a gimbal [not numbered: inherent property of attached slider to load beam] coupled to the second end of the load beam [16], and a slider [20] coupled to the gimbal.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 2, 3, 7 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takagi et al. (hereinafter Takagi) (US 6,721,133 B2) as applied to claims 1, 6 and 11 above, and further in view of Inoue et al. (hereinafter Inoue) (US 6,362,936 B2).

- Regarding claims 2, 3, 7 and 12, Takagi discloses all the features as previously noted, except the mount plate having a thickness greater than 0.22 mm and the hinge having a thickness greater than 0.05 mm.

Inoue discloses a mount plate having a thickness greater than 0.22 mm and a hinge portion having a thickness greater than 0.05 mm [col. 2, lines 60-63].

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It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the mount plate and hinge of Takagi with the dimensions as taught by Inoue.

The rationale is as follows: One of ordinary skill in the art at the time of the invention would have been motivated to make the mount plate and hinge of Takagi with the dimensions as taught by Inoue so as to provide predetermined mechanical characteristics such as natural frequency and stiffness [Inoue; col. 1, lines 30-32].

2. Claims 4 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takagi et al. (hereinafter Takagi) (US 6,721,133 B2) as applied to claims 1, 6 and 11 above, and further in view of Yonemura et al. (hereinafter Yonemura) (US 6,181,521 B1).

- Regarding claims 4 and 13, Takagi discloses all the features as previously noted, except the load beam having a thickness greater than 0.12 mm.

Yonemura discloses a load beam having a thickness greater than 0.12 mm [col. 2, lines 60-63].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the load beam of Takagi with the dimensions as taught by Yonemura.

The rationale is as follows: One of ordinary skill in the art at the time of the invention would have been motivated to make the load beam of Takagi with the dimensions as taught by Yonemura so as to prevent self-excited vibration during disk drive operation [Yonemura; col. 2, lines 53-59].

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3. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable Takagi et al. (hereinafter Takagi) (US 6,721,133 B2) as applied to claim 6 above, in view of Inoue et al. (hereinafter Inoue) (US 6,362,936 B2) and further in view of Yonemura et al. (hereinafter Yonemura) (US 6,181,521 B1).

- Regarding claim 8, Takagi discloses all the features as previously noted, except the hinge having a thickness greater than 0.05 mm and the load beam having a thickness greater than 0.12 mm.

First, Inoue discloses a hinge portion having a thickness greater than 0.05 mm [col. 2, lines 60-63].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the hinge of Takagi with the dimensions as taught by Inoue.

The rationale is as follows: One of ordinary skill in the art at the time of the invention would have been motivated to make the hinge of Takagi with the dimensions as taught by Inoue so as to provide predetermined mechanical characteristics such as natural frequency and stiffness [Inoue; col. 1, lines 30-32].

Second, Yonemura discloses a load beam having a thickness greater than 0.12 mm [col. 2, lines 60-63].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the load beam of Takagi and Inoue with the dimensions as taught by Yonemura.

The rationale is as follows: One of ordinary skill in the art at the time of the invention would have been motivated to make the load beam of Takagi and Inoue with the dimensions as

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taught by Yonemura so as to prevent self-excited vibration during disk drive operation [Yonemura; col. 2, lines 53-59].

4. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takagi et al. (hereinafter Takagi) (US 6,721,133 B2) as applied to claim 11 above, and further in view of Jagt et al. (hereinafter Jagt) (US 5,898,543).

- Regarding claim 14, Takagi discloses all of the features, *supra*, except the radius geometry of the hinge which includes a first radius of curvature, a second radius of curvature and a third radius of curvature, the first radius being closer to the mount plate than the second radius, the second radius being closer to the mount plate than the third radius, and wherein the third radius is greater than the second radius

Jagt shows the radius geometry includes a first radius of curvature, a second radius of curvature and a third radius of curvature, the first radius being closer to the mount plate than the second radius, the second radius being closer to the mount plate than the third radius, and wherein the third radius is greater than the second radius [see Examiner's embedded Fig. 5].

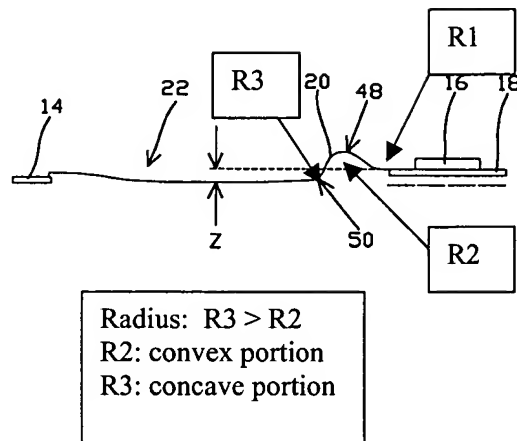


FIGURE 5

It would have been obvious to one of ordinary skill in the art at the time the invention was made to make the hinge of Takagi with the configuration as taught by Jagt.

The rationale is as follows: One of ordinary skill in the art at the time of the invention would have been motivated to make the hinge of Takagi with the configuration as taught by Jagt in order to minimize the torsional gains at specific resonance frequencies that are present with single preformed hinge bends [Jagt; col. 4, lines 20-25].



*Allowable Subject Matter*

5. Claims 5, 9 and 10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. Claims 15-54 are allowed. The following is a statement of reasons for the indication of allowable subject matter:

- Claim 15 specifies a suspension for a head stack assembly of a disk drive, which requires:

*"the hinge including a first surface having a first convex portion defining a first radius of curvature, adjacent the first hinge end and adjacent a first concave portion of the first surface, defining a second radius of curvature, adjacent a second convex portion of the first surface, defining a third radius of curvature adjacent a second concave portion of the first surface, adjacent the second hinge end."*

Jagt et al. (hereinafter Jagt) (US 5,898,543) shows a hinge including a first surface having a first convex portion defining a first radius of curvature, adjacent the first hinge end and adjacent a first concave portion of the first surface, defining a second radius of curvature, adjacent a second convex portion of the first surface, defining a third radius of curvature. Jagt does not show the third radius of curvature adjacent a second concave portion of the first surface adjacent the second hinge end as required by the applicant's claimed invention.

- Claims 23, 27, 32, 37, 42, 47 and 51 specify a load beam for a head gimbal assembly, which requires:

*"the hinge portion defining a radius geometry that includes at least three radii of curvatures configured to lower load beam toward the disk such that a first surface of the hinge portion defines at least two concave portions and at least two convex portions, the first surface of the hinge portion being coupled to the actuator arm."*

Jagt et al. (hereinafter Jagt) (US 5,898,543) shows the radius geometry includes a first radius of curvature, a second radius of curvature and a third radius of curvature, the first radius

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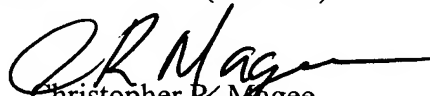
being closer to the mount plate than the second radius, the second radius being closer to the mount plate than the third radius, and wherein the third radius is greater than the second radius. Jagt does not show the first surface of the hinge portion defines at least two concave portions and at least two convex portions, the first surface of the hinge portion being coupled to the actuator arm as claimed in the applicant's invention.

### *Conclusion*

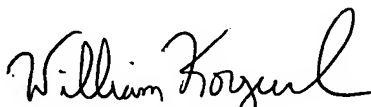
7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher R. Magee whose telephone number is (571) 272-7592. The examiner can normally be reached on M-F, 8: 00 am-4: 30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Korzuch can be reached on (571) 272-7589. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Christopher R. Magee  
Patent Examiner  
Art Unit 2627

March 21, 2006  
crm

  
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